

EXTRACTION

Title: **Extraction (What's in the cereal you eat?)**

Level: **K-12**

Day/Time:

[Academic Expectations](#)

[Core Content for Assessment:](#)

Objective:

To introduce students to the concept of extracting valuable minerals from the rock that contain these minerals.

Materials:

1 cup iron fortified cold cereal (Total) 2 cups hot water

1 clear drinking glass

White magnet stirring bar or popsicle stick with magnet painted with white epoxy paint.

Stir Plate

Activity:

Select a sample of cereal that is iron-fortified, such as Total. Add cold, warm or hot water to make a slurry and stir with the stir plate until the cereal is soggy. The longer the cereal is stirred the more complete the iron removal. Usually 30 minutes gives the maximum iron recovery. After 10 to 20 minutes, remove the magnetic stir bar and note the dark slivers of iron on the ends. These are particles of metallic iron.

Discussion:

Why does this work and why is stirring necessary? Cold cereals are fortified with vitamins and minerals for health. Metallic iron is added to fortified cereal and this form of iron is magnetic. In this experiment the magnet collects the iron. In other processing methods for metals, such as coal beneficiation, copper, uranium, and gold, acidic or caustic water, gravity separation, or flotation might be used. An example of gravity separation is gold-panning. When a gold pan is agitated, the heavier mineral drops to the bottom of the pan and the lighter rocks wash away.

Follow-up Activities:

What other fortified food product could be used instead of cold cereal? Your students might want to try an iron rich drink or a cooked hot cereal. Have the students crush the cold cereal before adding the water. Does this improve the recovery time? Does it make a difference if the cereal is crushed in a separate container and then transferred to the drinking glass? Students may want to weigh the recovered iron.